Notebook, N-10-12-10

Run Schedule Short tubes

Normal Run Rates (Room temp.)
Charge 15 Hours @ 300 M-A
Dischg @ 200 M A
Hot test Rates
Charge & Dischg. @ 225 M-A except Rdg
Run which Dischgs @ 200 M-A. to 1.V

3 Normal } New
10 Hot } Short Tubes
3 Normal } Silverlake
40 Hot } Tubes
3 Normal } Hot Test
50 Hot } tubes
3 Normal
50 Hot.
3 Normal

1st 3 Normal Runs discharge to .9V
After 50, 100, 150 & 200 Hot Runs discharge
1st & 2nd Runs to .9V & 3rd Run to .9V & .5V
After 250 Hot Runs discharge - 1st 2nd 3rd
and 4th to .9V & .5V
After 300 Hot Runs discharge 1st 2nd 3rd &
4th to 1.V .9V & .5V

Detailed Schedule

NEW SHORT TUBES	3 Normal	to .9V
10.-	10 Hot	
SILVER LAKE TUBES	3 Normal	1st & 2nd to .9V ~~[illegible]~~, 3rd .9 & .5V
50.-	40 Hot.	
HOT TEST TUBES	3 Normal	1 & 2 to .9V. 3rd to .9V & .5V
100.-	50. Hot	
	3 Normal	do
150.-	50 Hot	
	3 Normal	do
200.-	50 Hot.	
	3 Normal	do
250.-	50 Hot	
	4 Normal	4 Runs .9V & .5V on each
300.-	50 Hot.	
	4 Normal	4 Runs 1.V. .9V & .5V on each

repeating the 4 Normal to 1.V .9V & .5V after every 50 additional Hot Runs

Solution changed after every 50 hot runs, renewed with 21% KOH + 11.2 grams Li OH per liter or 21% KOH + 0.2 gram Li OH per 175 C.C.

Tubes to be inspected & physical condition recorded after every cycle of hot runs & amount of sediment weighed & entered.

Reports and Records

All normal run results and Hot capacity are entered daily & when that particular series is finished, results of tests are put in record books, also T A E's remarks (C.O.s etc)

Long Tubes (Report. TAE 1/4")

Regular Factory Daily Production.

Set up in long cans & run regularly in 21% + 11.2.

Never run hot unless special, when they may be put up under short tube Nos: & run same schedule as shorts excepting as to rates.

Normal Rate
Charge 15 hours @ 400
Dischg. @ 250 M-a ~~[illegible]~~ to .9V then C.O. after 3rd Run
Hot test Rates Chg & Dis @ 300 M-a
Dis. to 1.0V Reg Run the same

Regular & Experimental short tube records are also entered on Record cards, and sent to Edison Chemical Wks, after each cycle the physical condition of each tube being also noted & entered on record card after every 50 hot hot runs.

New Short Tubes receive their first Charge on either Monday P.M. Wednesday P.M. or Friday P.M.

December 1914. When a group of Regular Short Tubes is cut out after the 16th run the elements, with solution & sediment for two tubes only, are to be sent to Silver Lake, once a week, for analysis.

Notes on records continued four pages forward

April 15/15. Five different sets of tubes, instead of one, to be returned each week after 16th Run.

Commencing June 10/14 all T.A.E. Tes were assembled in short cans, pocket #149 E (T.A.E. EXP 232) being the first

On June 26th/14 – 16 pockets which were originally put up in ~~short cans~~ glass jars were reassembled with new nickel & put up in cans to run on hot test.

T. A. E. (Marked Tes)

Set up in short cans and run regularly in 21% + 11.2

All small Tes.

Charge 15 hours @ 400 M-A

Run schedule

1st Run, Normal Dis: @ 300 M-A to 1.V & .5V
2nd & 3rd " " " @ 750 M-A to 1.V & .5V
4th & 5th " " " @ 300 M-A to 1.V & .5V

50 Hot Runs @ long tube rates, unless marked for Cold Test (35°F Dis.)

Repeat (with 5 Runs Normal & 50 hot) indefinitely until C.O.

Report to T. A. E. Tes, Hot Tes. & Long Tubes (1/4")

April 19th 1915. Solution in Cobalt cells to be changed every 48 runs.

Silverlake corrugate [illegible] @
460 [illegible] per [illegible] 5" [illegible] =
103 [illegible] for [illegible]

Silverlake Tes.

Loaded @ Silver Lake
Set up in glass jars & run regularly
in 21% + 11.2

Normal Runs only (5 gram pockets)
Charge 15 hours @ 400 M-A

1st 2nd 3rd Dis. @ 300 MA to 1.V

4th 5th 6th Dis @ 750 MA to 1.V & .5V

7th & 8th Dis @ 300 MA to 1.V
" " " " to 1.V & .5V

8 gram pockets Charge @ 500 MA
Discharge @ 400 MA
Runs 1-2-3-7 & 8 & 750 M.A Runs
4-5 & 6 to same points as 5 gram

Michrometer calipers taken after 8th Run.

Record & Report Silver Lake Te. Bk
also Daily Report to Silver Lake & record
of average room temp.

May 13th/14
On all Tes that are to be run until notified solution changes after run 48 & every 48th run thereafter. i.e after every 6th cycle

June 10th/14 Commencing this date all Exp. Tes that "are to run until notified" will be assembled in short cans.

July 21/14 No S.L., REG. or EXP. Tes or REG. DI Tes to receive 1st Charge Friday nights as this will bring the 8th run Monday making a stand between the 7th & 8th runs

April 19th/15 Reading run on Hot test to be about 5th from end of each cycle, so that it can be repeated should the results of 1st be abnormal in any way

Sept 23rd 1915 At J. F. Miller's request all Regular Silver Lake 5 & 8 gram test pockets will receive 2 cycles of 8 runs each @ respective rates instead of one cycle as heretofore

Cold Test Tes.

Regular test for these & one that gives the most information in the shortest time is.

First. Cells must be cans, not glass
Second As cells have already run normal & stood idle after give —
1 Normal Run @ 75°F
Chg 15 hrs @ 400 MA @ 75°F
Dis @ 300 MA to 1.V & .5V @ 75° to bring them back to average), then

3 Runs Charge 15 hrs @ 400 M.A @ 75°
Dis. @ 300 MA to 1.V & .5V @ 35°
3 Runs Charge 7 hrs @ 400 MA @ 75°
Dis @ 300 M.A. to 1.V & .5V 35°
After dischg @ 35°F raise temp of cells to 75° & dischg again to .5V to get residual

Report T. A. E. Geo.

D. P. Fes. (8 grams)

Same rates &c as Silver Lake 8 gram Fes.

If capacity is below 1900 after 8th run reassemble with new mix & re-run & if still low C.M & duplicate.

March 28th 1913. Effective April 1st all D.P. Fe pockets will be pressed @ 115 atmospheres. This is equivalent to the pressure of 120 tons per A plate, used in regular manufacture.

AUG [illegible] 1913 Commencing with pocket # 2113 all D.P. Fe pockets will be assembled in cans instead of glass jars as heretofore

Up to May (approx) 1913 all D.P. pockets were shaped with convex die @ 100 atms, or 4 tons per pocket, before pressing with corrugating die @ 115* atms or 5 tons per pocket, this was discontinued, as method was not in use in Factory

D.P. 'B' Fe Test.

7" Can	435 CC	21 + 11.2
8" "	500 "	"

3 Runs Charging 15 hours @ 3.75 a and disch to 1.V @ 3.75 a

Report to ~~[illegible]~~ R.A. Bachman, J.F. Miller, McClain & Monahan
Min: Cap: 25 A-H.

Temperature of Hot Test tables to be kept from ~~130° — 136°~~ F
126° to 132° F {changed July 18/14 TAE}

Cells to be steamed off before Hot test, and after to take off carbonate.

No sets to start on Thursday as this will bring 3rd Run on Monday

Punch a big hole in metal tags of cells having special solution

3-25-1915

Entering capacities of Ni & Fes

Heretofore it has been customary to enter Cold test capacities in Purple ink, & Normal capacities in Blue ink. After drying however they are very similar So hereafter Green ink will be used instead of Purple

Blue ink Normal Capacities
Green " Cold
Red " Hot

When the capacity of Daily Product in 1/4" long tubes is below 1700 M-A-H on the 3rd run and Daily Production 8 gram Fes below 1900 MAH on ~~third~~ eight run they are to be reassembled with new Fes & new Nis respectively & run over & should they then be below capacity after 3 & 8 tube pockets more runs (i,e, run #6 & 16th respectively) they are to be duplicated.

April 14/15 In the event of only one pocket being below capacity to other one is to be rerun with original nickels for comparison & should both be low, then a pocket with same mix if one is on test, & of good capacity is to be rerun for same purpose.

3/16" tubes if below 900 M-A-H on 3rd run, & 1/4" tubes below 1700, are to be reassembled with new Fes, & a good capacity tube with same hydrate rerun with these for comparison

Loading "Short Tubes." 1/4" x 3 5/16"

48

Speed ~~40 to 48~~ tamps per minute

Weights

Tamping Rod 3 1/2 lbs.

Flake 40 Milligrams per 10 Dumps

Hydrate 235 to 245 milligrams per 10 Dumps

Dumps 250 to 275 per tube

Weight per tube 7.100 gr to 7.800 grams

Reaming

Correcting tubes

Filing to proper length

Cap @ top put in before removing from machine

Loading 4 tubes instead of 2 when weights exceed 7.800 grams. 5/12/14 2 Tubes only to be loaded from this date unless there is a difference of 200 milligrams when an additional tube will be loaded

Before starting to load a tube, the dasher in Flake hopper must be set in an upright position.

Before loading, the hydrate is ground & then ~~passed~~ screened thru a 30 & then 100 mesh sieve

Changes & Repairs made on Loading Machine

August 11th 1913. New feed slide to hydrate hopper.

September 10th 1913. New tamping rod, and revolving hopper repaired

March 21st 1913 Replacing set screw

April 1st 1913 Repairing bag.

October 3rd 1913 Michrometer set screw adjustment to slide for hydrate feed

March 24th 1914 Up to this date, it had been customary to tap hydrate hopper, while taking the 10 dumps, to get weight per 10 dumps, but from ~~this~~ date on it was decided to eliminate the tapping

March 26th 1914 New dasher (stirrer) to replace old one in Flake hopper

March 28th 1914. It was found that the system adopted 24th inst for obtaining the 10 dumps preparatory to actual loading was not good a/c of weights increasing after each tube was loaded, so it was decided to tap hopper for one minute, & then take 10 dumps

March 31st 1914 Reverted to old style of taking 10 dumps

i.e., tapping hydrate hopper while so doing
A special standard hydrate #4873 & 74 (Factory
lot #649) to be used for checking loading
weights, if necessary, after readjusting machine,
with special samples.
April 9th/14 Upper part of tamping rod repaired
" 6/14 Mill for grinding hydrate put into service
instead of grinding by hand as heretofore
June 27th/14 Use of mill discontinued from this date
under instructions from L.A.E. (per J. V. Miller)
& old method of grinding with pestle & mortar
reverted to.
June 16th/14 Loading machine transferred to Tube
inspection Dept. under W. Archer's supervision
June 18/14 Starting with Reg #481 all tubes are
being reamed, before being taken out of
mould after loading. The variation in
weights due to reaming was from 80 to 180
milligrams, when taken on different tubes
July 7/14 All samples to be dried for 1 hour, before
loading, @ 212°F. This starts with $Ni(OH)_2$
(Reg) 5278 & Experimental #1944.
July 21st 1914 Starting with sample $Ni(OH)_2$ #5300
all samples will be dried in new gas oven
installed in Tube inspection Dept instead of
in Dr. Greenley's Dept as before.

Forming treatment for Fes. @ 130°F

SEP 18 1914 All Fes that are to be used in assembling with "Test" nickels are to receive the following treatment.

Assemble in "B6" containers using nickel strips for the positive element. 11 Strips to 10 pockets, fill with 21% KOH + 11.2 grams LiOH per liter, put in hot box, and warm electrolyte up to 130°F

Then give 2 Runs, charging 15 hours @ 2 Amperes, and discharging for 9 hours @ the same rate

Irons are now ready for use, and are to be kept immersed in solution until they are assembled with the test nickels, and this must be done as quickly as possible, to avoid unnecessary exposure to the air.

August 12th 1909

Regular Forming Treatment #3 (A4 Cells)

In each new cell put 20 grams dry LiOH then fill with 1400 CC 21% KOH containing 50 grams LiOH per liter equal to 90 grams LiOH per A4 cell.

Let soak @ least 15 hours.

Run #1 Charge 48 hours @ 15 Amps. Discharge @ 30 Amps to .5V

Run #2 Charge 10 hours @ 30 Amps and 14 hours @ 15 Amps. Discharge @ 30 Amps to .5V

Run #3 Same as Run #2

Run #4 Charge 15 hours @ 30 Amps. Discharge @ 30 Amps to .5V

Run #5 Same as #4. To be given only when run #4 comes after standing

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Data on Reports & Records for

Small Cells

Short tubes

Made up out of anything but iron and are 3" long & 1/4" dia.
Assembled with excess iron (2 pockets) in short can & run regularly in 21% KOH +11.2 grams LiOH per liter or 21% + 2 grams LiOH per 175 C.C.

Special long tubes (which are made up in Factory) may be run under short tube nos.) & under same schedule for rates (see long tubes.) which are

Normal Run Rates (Room Temp.)
Charge 15 hrs @ 400 M-A } 3
Discharge @ 250 M-A to .9 V } Runs

Hot test Rates
Charge & Dis. @ 300 M-A to 1.V
Rdg same avg ~~300~~ M-A.

Special long tubes

All nickels that are used for testing Fes, and Fes that are used for testing nickels, are to be discarded after being in service for 6 months, the ends of same to be stamped, so that there will be no difficulty in placing the actual month & year they were first placed on test.

Nickels do not start a new cycle on Thursday PM a/c of causing stand between 2nd & 3rd run & Fes do not start a new cycle Friday PM a/c of causing stand between 7th & 8th run

3-19-1915 All short tubes are to be inspected for physical condition after every cycle of normal & hot runs, same to be noted on records whether OK or defective

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3/29-15. When changing solution the amount of sediment, if excessive is also to be recorded

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Regular order of Tests for A4 Cells.

After the forming runs, give 3 or 4 normal efficiency tests (7 hour charge @ 30 Amps, discharging @ 30 Amps to 1.V)

Then give 12 Endurance Runs (charging 7 hours @ 30 Amps, discharging @ 40 Amps to .5V & short circuiting) counting the efficiency tests above as Endurance runs

Then give 3 overcharge runs, 15 hours @ 30 Amps, discharging @ 30 Amps to .5V

Repeat this cycle of efficiency tests: endurance & overcharge runs 4 times, just as noted above (48 Endurance runs); after that, run the same way but giving 50 Endurance runs (including efficiency tests) between the normal overcharge runs

After 225 runs (total, more or less) fresh solution is to be put in all the cells; and unless otherwise specified, this will be 21% KOH + 20 grams LiOH per liter. The fresh solution is to be put in after the normal overcharge tests and efficiency tests which come nearest to the 225th run; and then the cell is to be given 3 normal overcharge runs & 3 or 4 normal efficiency tests in the new solution before putting it back on the endurance test. (225 - 450 - 675 - 900 - 1125 - 1350 - 1575 - 1800 - 2025)

December 17th 1910

Note the following change in the regular order of running A4 Cells for Endurance.
Hereafter cells will have only two series of 12 endurance runs to begin with, then one series of 25, thereafter 50 endurance runs will be given as usual.

Dec. 6th 1910

Renewal solution is now 25% KOH + 15 grams LiOH per liter.

DEC 15 1914

Forming treatment #3 which was in operation previous to March 10th 1911 again reverted to, all later ones being discontinued.

Mar 10th 1911

Regular Forming treatment #5 (A4 Cells)

Run #1 Charge 30 hours @ 20 Amperes, discharge @ 30 Amps. to .5 V

Run #2 Charge 15 hours @ 30 Amps. discharge @ 30 Amperes to .5 V

Run #3 Same as #2

Regular Forming Treatment #6. June 6/11

Run #1. 30 hrs @ 20 Amps. Run #2 15 hrs @ 30 Amps then regular series Overchg. & Efficiency

Note

All overcharges will be for 12 hours @ 30 Amps. instead of 15 hours @ 30 Amps, as heretofore.

Sp. Gr. Rdgs to be taken on All types of cells, on the 1st & 2nd Charge of each cycle of Overcharge Runs.

Regular Forming Treatment for "B" 4 Cells.

In each new cell put ~~50~~ 55 grams Li OH, then fill with (~~850~~ 814 CC) 21% K OH + 50 grams Li OH per liter equal to 55 grams Li OH per B4 cell.

Run #1 Charge 30 hours @ 10 Amps, discharging for 3 hours @ 16 Amps.

Run #2 Charge 9 hours @ 16 Amps, discharging for 3 hours @ 16 Amps.

Run #3 Same as #2

Run #4 Charge 9 hours @ 16 Amps, discharging @ 16 amps to .5V.

Runs #5-6-7 Charge 12 hours @ 16 Amps. discharging @ 16 Amps to .5V

December 14
This forming is practically in accordance
with the schedule [illegible] "A" type

Dec 10th 1910

Table of Sp. Gr. Corrections @ temperatures from 65°F to 110°F

21% KOH. straight

Corrections give values correct @ 65° F

Temp. of Solution °F		Temp. of Solution °F		Temp of Solution °F	
65	add 0	82	add .0034	99	add .0068
66	" .0002	83	" .0036	100	" .0070
67	" .0004	84	" .0038	101	" .0072
68	" .0006	85	" .0040	102	" .0074
69	" .0008	86	" .0042	103	" .0076
70	" .0010	87	" .0044	104	" .0078
71	" .0012	88	" .0046	105	" .0080
72	" .0014	89	" .0048	106	" .0082
73	" .0016	90	" .0050	107	" .0084
74	" .0018	91	" .0052	108	" .0086
75	" .0020	92	" .0054	109	" .0088
76	" .0022	93	" .0056	110	" .0090
77	" .0024	94	" .0058		
78	" .0026	95	" .0060		
79	" .0028	96	" .0062		
80	" .0030	97	" .0064		
81	" .0032	98	" .0066		

When discharging cells @ rates higher than normal, instead of discharging to 1.00 Volt, discharge .10 Volt lower when rate is double normal, & so on pro rata.

Explanation of Reactions in the Edison Storage Battery

Passage of current decomposes the electrolyte (KOH) setting free OH @ the anode & K @ the cathode

The active materials of the electrodes react with these somewhat as follows. (Charge to discharge)

$8.OH + 3Fe - Fe_3O_4 + 4 H_2O$ (Negative)

$8K + 6NiO_2 = 2Ni_3O_4 + 4K_2O$ (Positive)

8KOH

Charged condition

Discharged condition

Forms 8KOH

Note. The Fe & Ni Oxides probably are hydrated but are treated as true Oxides for the sake of simplicity.

List of A4 Cells on a "Life" Test receiving Special Treatment

25 Runs [illegible] in Endurance

Sp18 & Sp.19 - Charge continuously during both charge & discharge of rest of cells while running on Endurance, after which give Overcharge & Efficiency discharging in the regular way. Measure amount of water added to each cell while running in Endurance

15331 Discharges to 1.00 Volt only on all Efficiency & Endurance runs & .50V on Overcharge

15334 Sealed in Endurance i.e., no water to be added & when capacity is 130A-H to .5V take out, measure depth solution is below tops of plates & how much distilled water is necessary to bring to 1/2" above tops of plates.

15654 Add water from faucet to cell when necessary instead of distilled water, measure amount

#50066 Once a week add 100CC of sea water (#50065 filled as required with distilled water) when running & pro rata for each part of week.

50080 & 81 Fill when necessary with natural melted ice water.

Voltage & temp. readings to be taken @ the end of every charge

#72095 & 72130 Run on Endurance charging only, standing while rest of cells discharge, after which Overcharge & Efficiency discharging regularly (Sp. Gr. Rdg. every 10th Run while on Endurance

#1324A & 1326A Run continuously on Overcharge & discharge to 1. Volt only except @ start of every 50 runs when 3rd electrode readings will be taken & cells discharged to .5V for 3 runs.

#1338A & 1341 A Run continuously on Efficiency & discharge for 3 hours only, except @ start of every 50 runs when 3rd Electrode readings will be taken & cells discharged to 0.5 V for 3 runs.

Sept. 25th 1915

1st Filling solution changed from 21% KOH + 50 grams LiOH per liter, to – 15% NaOH + 50 gram

B.H. solution 15% NaOH + 35 grams LiOH per liter.

Soda to be used for 1st filling only renewals to be made with standard potash renewal solution.

March. 1912

Regular Forming treatment for ~~H &~~ M type

Electrolyte. 21% KOH and LiOH in proportion to .375 grams per short tube for "H" type and .750 gram per long tube for M type.

Type	Capacity	Normal Rate	3 Runs chg. Forming treatment
M H2	1.1	.25	Chg. at .25 12 .15
M H4	2.25	.50	12 .50 12 .30
M H8	4.5	1.0	12 .60
M H12	6.75	1.5	12 1.50 12 .90
M 20 ~~H8~~	12.5 ~~10~~	2.5 ~~2.0~~	12 2.00 12 1.20
~~H12~~	~~15~~	~~3.0~~	12 3.00 12 1.80

Above decided to call "M" type. It was 12H type, the same except long tube

Reg. Then 3-12 hour charges @ normal rate making total of 6 Runs Dischg. @ normal rate to .5 V all runs.

Dec 16th 1914

Forming treatment for this type of cell to be in accordance with schedule of Dec 14th /14 for "H" type cells.

Jan. 4th 1915

2 Forms M20 manufactured. Can of regular 5 15/16" high. Can of H & M. Spcl about 1/4" higher. First filling for Reg. 21% KOH + 50 gr. LiOH per liter to 3/4" above tops of plates. No dry LiOH. First filling for H & M. Spcl 17% KOH + 35 grams LiOH per liter to 2" above tops of plates. No dry LiOH.

3/3/15 Renewal sol for H & M Spcl M20. 19.5% KOH + 15 gr. LiOH per liter.

Jan 18th 1912

"C" Type Data.

Normal Charge 3 3/4 hours.
Do. Overcharge. 8 hours

Type	Rated Capacity.	Normal Rate	"Endurance" Rate
C7	140 AH	50 Amps.	65 Amps
C.8	160 "	55 "	75 "
C.10	200 "	70 "	95 "
C.12	240 "	85 "	110 "
C14	280 "	100 "	135 "

Bismuth cells which discharge to .9V instead of 1.00 Volt on Efficiency test.

BI
15646
18866-7
18870
18871 with 19838 regular
18872-3
18874-5 with 19839 regular
25428
25429
25430
25431

G. & J. Type Cells.

January 13th 1915

Forming Treatment

Run #1 30 hours @ ½ normal run

Run #2 7 hours @ normal rate
10 " @ ½ " "

Run #3 Same as Run #2

Run #4 10 hours @ normal rate

All discharges @ normal rates to 5 V

Rating
"J" Type 3.75 Amperes per plate
"G" " 7.50 " " "

First filling solution

"J" Type. 21% KOH + 8.5 grams LiOH per plate
"G" " " " + 16.0 " " " "

Dies for Pressing & Crimping Tes.

Pairs	Type	Form	Mark
One	B	Edge crimp	"B" type
"	A	Corrugating	882 and 8.G
"	A	"	Die F & 5G
"	A	Edge crimp	8 } not in frames
"	B	" "	B }
"	A	" "	#2
"	"	" "	4
"	"	Window pattern	5
"	"	Convex	8GC
"	"	Flat {were once convex}	—
"	"	Corrugating	8.G.

July 3rd 1914. Under instructions from J.A.E., F Ott made up a new die for pressing Tes flat & crimping @ edges called #1.

July 24th 1914. Dies #1 changed so that there was less pressure on centre of pockets & number changed to #4.

Ott #3, was to press pockets first with convex die @ 3.26 tons, then with Ott #2 die @ 5 tons.

*Aug 24th 1915 Die #882 (8 plane) shallower corrugation than 8.G

*June 6th 1913. Drawings were passed for making up a new die with the corrugations shallower, & dies made & put into service in Factory only

July 7th 1914 Die #B same as #4 only not so deep in centre.

Aug. & Sept. Dies "B type" "8" & "B" similar to #4 only made in Tool Room here by Freeland

Sept. 24th 1914 Die #5 made up by Ott has window pattern

Sept(?)/15 Die F & 5 G for corrugating 5 plane pockets

Die 8.G.C. convex for shaping pockets before pressing with corrugated die. The use of these was discontinued in May (approx) 1913 as this was not being done in Factory

*Flat dies (originally convex) were used in conjunction with dies made by F Ott.

over →

Die 8.G. These dies are used for pressing all D.E. 8 grand Teo, those marked 882 & 8G which were made to correspond with the die adopted in Factory after June /15, not being put into service, as the standard for electrical test would be changed.